

## CLAIMS

What is claimed is:

1. A crimping system comprising:
  - at least one crimp tube for use in a surgical procedure, the at least one crimp tube having an aperture formed along a long axis of the crimp tube;
  - a suture located within the aperture of the crimp tube, at least one end of the suture being actuated to place the suture in tension; and
  - a crimping tool having:
    - a first arm having a proximal end and a distal end, the proximal end comprising a handle and the distal end comprising a first jaw,
    - a second arm having a proximal end and a distal end, the proximal end comprising a handle and the distal end comprising a second jaw, the second arm hingedly connected to the first arm,
    - a first crimping member integral with the first jaw of the first arm, the first crimping member having a first inner surface width, and
    - a second crimping member integral with the second jaw of the second arm, the second crimping member having a second inner surface width, the first inner surface width and the second inner surface width limiting the deformation on the crimp tube when the crimping tool is placed in a closed position during a crimping procedure.
2. The crimping system of claim 1 wherein the crimping tool comprises a gap between the distal portion of the first jaw and the distal portion of the second jaw when placed in a closed position.
3. The crimping system of claim 2 wherein the gap comprises a distance of 0.025 inches.

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4. The crimping system of claim 1 wherein the first crimping member and the second crimping member comprise mirror image geometries.
5. The crimping system of claim 4 wherein the first crimping member and the second crimping member comprise curved geometries.
6. The crimping system of claim 4 wherein the first crimping member and the second crimping member comprise rectangular geometries.
7. The crimping system of claim 1 wherein the crimping tool comprises a double action mechanism.
8. The crimping system of claim 1 wherein the at least one crimp tube comprises at least one internal diameter edge having a beveled surface.
9. The crimping system of claim 8 wherein the beveled surface comprises an angle of  $45^\circ$  relative to a long axis of the crimp tube.
10. The crimping system of claim 1 wherein the at least one crimp tube comprises a biocompatible material.
11. The crimping system of claim 1 wherein the at least one crimp tube comprises an oval-shaped cross-section.
12. The crimping system of claim 1 wherein the first inner surface width comprises a width of 0.0295 inches.
13. The crimping system of claim 1 wherein the second inner surface width comprises a width of 0.0295 inches.

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14. A method for crimping a crimp tube comprising:
- attaching a suture to a biological component;
  - placing the suture within a crimp tube;
  - actuating at least one end of the suture to adjust the tension of the suture;
- and
- crimping the crimp tube using a crimping tool having a first crimping member with a first inner surface width and a second crimping member with a second inner surface width, the first inner surface width and the second inner surface width limiting the deformation on the crimp tube when the crimping tool is placed in a closed position.
15. The method of claim 14 further comprising securing the suture within the crimp tube.
16. The method of claim 14 further comprising attaching a first crimp tube to a first free end of the suture and a second crimp tube to a second free end of the suture.
17. The method of claim 16 further comprising engaging the first crimp tube and the second crimp tube using a tensioning device to adjust the tension of the suture.
18. The method of claim 14 further comprising compressing the crimp tube in at least three locations.
19. The method of claim 14 further comprising compressing the crimp tube in not more than five locations.
20. The method of claim 14 further comprising preventing a significant stress riser at a crimp site on the suture.

21. A surgical instrumentation kit comprising:

a plurality of surgical crimp tubes including a first crimp tube for attachment to a first end of a suture, a second crimp tube for attachment to a second end of the suture and a third crimp tube for attachment to the suture between the first crimp tube and the second crimp tube;

a tensioning device for engaging the first crimp tube and the second crimp tube, engagement of the tensioning device adjusting the tension of the suture; and

a crimping tool to crimp the third crimp tube onto the suture, the crimping tool having:

a first arm having a proximal end and a distal end, the proximal end comprising a handle and the distal end comprising a first jaw,

a second arm having a proximal end and a distal end, the proximal end comprising a handle and the distal end comprising a second jaw, the second arm hinged to the first arm,

a first crimping member integral with the first jaw of the first arm, the first crimping member having a first inner surface width, and

a second crimping member integral with the second jaw of the second arm, the second crimping member having a second inner surface width, the first inner surface width and the second inner surface width limiting the deformation on the crimp tube when the crimping tool is placed in a closed position during a crimping procedure.

22. The surgical instrumentation kit of claim 21 wherein the crimping tool comprises a gap between the distal portion of the first jaw and the distal portion of the second jaw when placed in a closed position.

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23. The surgical instrumentation kit of claim 21 wherein the gap comprises a distance of 0.025 inches.
24. The surgical instrumentation kit of claim 21 wherein the first crimping member and the second crimping member comprise mirror image geometries.
25. The surgical instrumentation kit of claim 24 wherein the first crimping member and the second crimping member comprise curved geometries.
26. The surgical instrumentation kit of claim 24 wherein the first crimping member and the second crimping member comprise rectangular geometries.
27. The surgical instrumentation kit of claim 21 wherein the crimping tool comprises a double action mechanism.
28. The crimping system of claim 21 wherein the plurality of crimp tubes comprises at least one internal diameter edge having a beveled surface.
29. The surgical instrumentation kit of claim 28 wherein the beveled surface comprises an angle of 45° relative to a long axis of the crimp tube.
30. The crimping system of claim 21 wherein the plurality of crimp tubes comprises a biocompatible material.
31. The crimping system of claim 21 wherein the crimp tubes comprise an oval-shaped cross-sectional area.
32. The surgical instrumentation kit of claim 21 wherein the first inner surface width comprises a width of 0.0295 inches.

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33. The surgical instrumentation kit of claim 21 wherein the second inner surface width comprises a width of 0.0295 inches.
34. A crimping tool comprising:
- a first arm having a proximal end and a distal end, the proximal end comprising a handle and the distal end comprising a first jaw;
  - a second arm having a proximal end and a distal end, the proximal end comprising a handle and the distal end comprising a second jaw, the second arm hingedly connected to the first arm;
  - a first crimping member integral with the first jaw of the first arm, the first crimping member having a first inner surface width; and
  - a second crimping member integral with the second jaw of the second arm, the second crimping member having a second inner surface width, the first inner surface width and the second inner surface width limiting the deformation on the crimp tube when the crimping tool is placed in a closed position during a crimping procedure.
35. The crimping tool of claim 32 comprising wherein the crimping tool comprises a gap between the distal portion of the first jaw and the distal portion of the second jaw when placed in a closed position.
36. The crimping tool of claim 33 wherein the gap comprises a distance of 0.025 inches.
37. The crimping tool of claim 32 wherein the first crimping member and the second crimping member comprise mirror image geometries.

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38. The crimping tool of claim 35 wherein the first crimping member and the second crimping member comprise curved geometries.
39. The crimping tool of claim 35 wherein the first crimping member and the second crimping member comprise rectangular geometries.
40. The crimping tool of claim 32 wherein the crimping tool comprises a double action mechanism.
41. The crimping tool of claim 32 wherein the first inner surface width comprises a width of 0.0295 inches.
42. The crimping tool of claim 32 wherein the second inner surface width comprises a width of 0.0295 inches.

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